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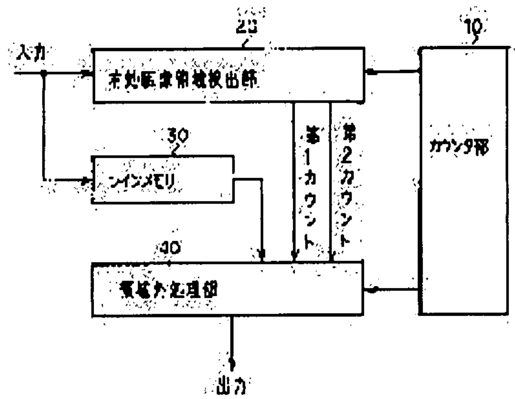
(54) IMAGE PROCESSING DEVICE

(57)Abstract:

PURPOSE: To provide an image processing device without requiring prescan and effective for an inclined document also for the fold of a book.



CONSTITUTION: The image processing device which performs image processing by using image data after A/D conversion read by applying photoelectric conversion to image information and comprised in such a way that at least an unrequired image area is detected as an image processing part and a detected unrequired area can be prevented from being recorded on an output device is constituted of a counter means 10 which detects the front and rear terminal parts of an effective image area by using the image data at every main scanning line, and outputs the count number of first and second picture elements until the front and rear terminal parts of the effective image area are detected after the start of main scan, respectively at every scanning line, line memory 30 in which picture element data is delayed by one scanning line, and an outside area processing means 40 which performs control on the image data read out from the line memory 30 so that an area other than the one held between the count number of first and second picture elements can be prevented from being recorded on the output device.

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CLAIMS

[Claim(s)]
[Claim 1] Perform an image processing using the image data after the A/D conversion which carried out photo electric conversion of the image information, and read it, and are the image processing system which performs the output to an output unit, and an image field unnecessary at least as the image-processing section is detected. In the thing of a configuration of that the detected unnecessary field was made not to be recorded on an output unit Use the image data for every horizontal-scanning line, and the front end section and the back end section of an effective image field are detected. A count means to output the 1st until it detects each of the front end section of an effective image field, and the back end section from initiation of horizontal scanning, and the 2nd pixel number of counts for every scanning line, As opposed to the image data read from the Rhine memory delayed by the 1 scanning line, and this Rhine memory in said pixel data The field across which it faced by the said 1st and 2nd pixel number of counts outside is an image processing system characterized by providing a processing-field outside means to control not to record with an output unit.
[Claim 2] The image processing system according to claim 1 characterized by having the spatial filter section performed as said image-processing section using the at least 3 scanning lines, and making it make it serve both as the Rhine memory used in the spatial filter section, and said Rhine memory.
[Claim 3] It is the image processing system according to claim 1 characterized by making specified image effective width into the front end section and the back end section when the front end section and the back end section become an outside from the image effective width which specified the effective width of an image, specified the effective width beforehand, detected the front end section of an effective image field, and the back end section, and specified them within the effective width.

[Translation done.]

* NOTICES *

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1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the image processing system which reads and outputs a manuscript image.
[0002]
[Description of the Prior Art] When carrying out an image scan using a solid-state scan component, the method which irradiates light in a manuscript side, is made to carry out image formation of the reflected light on solid-state scan components, such as CCD, carries out horizontal scanning of this electronically, and performs vertical scanning in a main scanning direction and the direction of a right angle is common. This scan is performed over the whole surface of a manuscript side.
[0003] Drawing 15 is the conceptual diagram of equipment conventionally. The manuscript 4 currently laid on the manuscript base 3 is irradiated with the exposure lamp 5. It is condensed with a lens 2 and image formation of the image information of the main scanning direction of a manuscript 4 is carried out on the solid-state scan components 1, such as CCD. By repeating horizontal scanning in the direction of vertical scanning, the image information from the whole surface of a manuscript 4 is read by CCD1. After the image processing of the read manuscript information is carried out by the image-processing system (not shown), it is outputted to the recording paper etc. by output units (not shown), such as a printer.
[0004] With equipment, there was a possibility that a manuscript is larger than the predetermined magnitude shown in drawing 15 , or it is small, or unnecessary parts other than manuscript 4 may be outputted when not set to the position of the manuscript base 3, or some images might disturb from the recording paper, conventionally.
[0005] Then, the image processing system as shown in drawing 16 is proposed (JP,4-15661,B). The same thing as drawing 15 attaches and shows the same sign. This example detects the location of a manuscript 4, divides it into a manuscript part and a non-manuscript part, and controls a printer according to it.
[0006] In the example shown in drawing 16 , one B2 sets of CCD for image formation is prepared with 1A. And the main scanning directions of a manuscript 4 are made to differ, as shown in drawing. And the front end section of a manuscript is detected by CCD1A, and the back end section of a manuscript is detected by CCD2. Consequently, as shown in drawing 17 , the coordinate information on a manuscript (L1, C1), and (L2, C2) are obtained. If coordinate information is acquired, he is trying to output fields other than the field surrounded by (L1, C1), and (L2, C2) white. For example, it is made for 255 and white data to be set to 0 by black data, using concentration data as 8 bits.
[0007]
[Problem(s) to be Solved by the Invention] There was a problem as shown below with the equipment shown in above mentioned drawing 16 .
** The PURISU can for identifying a manuscript field and the other field is required before this scan.
** Further, with this equipment, as shown in (a) of drawing 18 , when the manuscript 4 is placed aslant,

the field (hatching field of drawing) which mistakes for a manuscript and is outputted black will be generated.

** When copying a book, as shown in drawing (b), the fold part (hatching field) 7 will become black.

[0008] While this invention is made in view of such a technical problem and making a PURISU can unnecessary, it aims at offering an effective image processing system also to the fold of a slanting manuscript or a book.

[0009]

[Means for Solving the Problem] This invention which solves the above mentioned technical problem performs an image processing using the image data after the A/D conversion which carried out photo electric conversion of the image information, and read it. In the thing of a configuration of that are the image processing system which performs the output to an output unit, an image field unnecessary at least as the image-processing section is detected, and the detected unnecessary field was made not to be recorded on an output unit Use the image data for every horizontal-scanning line, and the front end section and the back end section of an effective image field are detected. A count means to output the 1st until it detects each of the front end section of an effective image field, and the back end section from initiation of horizontal scanning, and the 2nd pixel number of counts for every scanning line, It is characterized by providing a processing-field outside means to control so that the field across which it faced by the said 1st and 2nd pixel number of counts outside does not record said pixel data with an output unit to the image data read from the Rhine memory delayed by the 1 scanning line, and this Rhine memory.

[0010]

[Function] A count means is used for every 1 line (1 scanning line) of a manuscript, the front end section and the back end section of an effective image field are detected, the data is used, and the processing-field outside means permutes the unnecessary field with white data for every line. And it can follow and an image processing can be effectively carried out also about a slanting manuscript or this fold.

[0011]

[Example] Hereafter, the example of this invention is explained to a detail with reference to a drawing. Drawing 1 is the principle block diagram of this invention. The counter section to which 10 outputs temporary front edge ******, a temporary back end section signal, and counted value in response to a clock and predetermined size information in drawing, 20 receives the output and digital input image data of this counter section 10. The effective image field detecting element which outputs the signal (the 1st count signal and the 2nd count signal) which shows an effective image field for every line, The Rhine memory 30 remembers the input image data of one line to be at a time, and 40 are the processing-field outside sections which permute and output the outside of a field to "0" for every line of a manuscript image in response to the output of said effective image field detecting element 20, and the output of the Rhine memory 30. The count means indicated to the claim consists of the counter section 10 and an effective image field detecting element 20. Thus, it will be as follows if actuation of the constituted equipment is outlined.

[0012] The effective image field detecting element 20 outputs assignment size as the 1st count and the 2nd count, when larger than the size which manuscript size specified in response to the output and image data input of the counter section 10, and when smaller than the size specified by manuscript size, it outputs manuscript size as the 1st count and the 2nd count. Here, the data which made input image data binary with a certain threshold are used for effective image detection processing of the effective image field detecting element 20.

[0013] Therefore, since the 1st count and the 2nd count can show an original manuscript field when the manuscript 4 is placed aslant, as shown in (a) of drawing 18 , the hatching field of drawing 18 is not outputted black, as a result of permuting white and being outputted. Moreover, as shown in (b) of drawing 18 , when there is a fold part, the 1st count and the 2nd count are not outputted, therefore altogether, are permuted white and outputted. Thus, after it is determined what range for one line is regarded as a manuscript field, only the outside of a manuscript field is white, a mask is carried out,

except it, the mask of the applicable Rhine data memorized by the Rhine memory 30 is not carried out as manuscript information, but they are outputted. Thus, while making a PURISU can unnecessary according to this invention, an effective image processing system can be offered also to the fold of a slanting manuscript or a book.

[0014] Hereafter, actuation of each component of drawing 1 is explained to a detail. Drawing 2 is the circuit diagram showing the example of a detail configuration of the counter section 10. In drawing, the inverter with which G1 reverses the maximum image effective width FHV2, and 11 are 13-bit rise counters (it only abbreviates to a counter below) which undergo the output of this inverter G1 as a reset signal, and carry out the rise count of the clock CLK. The count output CNT2 (13 bits) is outputted from the Q output. Here, CLK is a clock used as the criteria of image data.

[0015] The 1st comparator which outputs a pulse signal when 12 receives the output of a counter 11 in A input (13 bits), receives the front end value PLFT of the assignment sizes (the front end value PLFT and the back end value PRIGT) in B input (13 bits) and A and B are in agreement, When the output of a counter 11 is received in A input (13 bits), the back end value PRIGT of the assignment sizes is received in B input (13 bits) and A and B of 13 correspond, it is the 2nd comparator which outputs a pulse signal. A front end value is set to n and a back end value is set to m.

[0016] The output of LEFT2 and the 2nd comparator 13 is set to RIGT2 for the output of the 1st comparator 12. The OR gate from which G2 receives the output of a comparator 12 in the input of one of these, and G3 are AND gates which receive the output of this OR gate G2, the output of a comparator 13, and the maximum image effective width FHV2. 14 is the flip-flop of D type with which the output of AND gate G3 is received in D input, and it receives Clock CLK in clocked into. And Q output of this flip-flop 14 is contained in the input of another side of said OR gate G2. Q output of this flip-flop 14 is set to INHV3. Thus, it will be as follows if it explains using the timing diagram which shows actuation of the constituted circuit to drawing 3 .

[0017] A counter 11 will start the count of Clock CLK from 0, if the R input is set to "1" in response to the maximum image effective width FHV2 shown in (b) as a reset signal. The output is outputted as shown in (c) as CNT2. On the other hand, as for a user, a user specifies manuscript size from a control panel. Or when the magnitude of most manuscripts is known with another means which is not illustrated, manuscript size is specified based on the value.

[0018] Manuscript size is given as the front end value PLFT (13 bits) and the back end section PRIGT (13 bits). A PLFT value is set to n and a PRIGT value is set to m (n<m). When sequential count-up of the output of a counter 11 is carried out and the value was set to n, the 1st comparator 12 generates LEFT2 pulse as shown in (d). On the other hand, counted value rises further, and when a value is set to m, the 2nd comparator 13 generates a pulse as shown in (e). A flip-flop 14 outputs the service area signal INHV3 as shown in (f) in response to these pulses.

[0019] Drawing 4 and drawing 6 are the circuit diagrams showing the example of a detail configuration of the effective image field detecting element 20. The circuit shown in these drawing 4 and drawing 6 is doubled, and the effective image field detecting element 20 of drawing 1 is constituted. First, the circuit shown in drawing 4 is explained. In drawing, 21 is a comparator which receives the criteria threshold THR (8 bits) to which the 8-bit picture signal PD 1 is given by the A input from a CPU interface in the B input. This comparator 21 generates the signal set to "1" at the time of A>B.

[0020] 22 is a d-type flip-flop which receives the output of a comparator 21 in the D input. Clock CLK is contained in clocked into. The AND gate in which G10 receives the output BLK1 of a comparator 21 and the Q output BLK2 of a flip-flop 22, and G11 are AND gates which similarly undergo the output of a comparator 21, and the Q output BLK2 of a flip-flop 22. These AND gates G10 and G11 differ in that the direction of G11 inputs the reversal signal of a flip-flop 22 to the direction of G10 inputting the reversal signal of the output of a comparator 21.

[0021] The d-type flip-flop from which 23 receives the output of AND gate G10 in the D input, and 24 are d-type flip-flops which receive the output of AND gate G11 in the D input. Clock CLK is contained in the clocked into of these flip-flops 23 and 24. The output of BLKHL2 and a flip-flop 24 is set to BLKLH2 for Q output of a flip-flop 23. Thus, it will be as follows if actuation of the constituted circuit

is explained referring to the timing diagram of drawing 5 .
[0022] A picture signal as shown in (a) of drawing 5 starts A input of a comparator 21. For this picture signal, black level is FFH (H shows a hexadecimal.). It is below the same. In addition, FFH Equivalent to 255 and the white level of a decimal are 00H. It enters by the 8-bit signal. It is a gray signal with a gradation difference between black and white. On the other hand, the criteria threshold THR (8 bits) is always inputted into B input of a comparator 21. the value of this criteria threshold is shown in (a) -- as -- A0H [for example,] it is .
[0023] It seems that the output (binary-ized signal) BLK1 is shown in (b) since the output of a comparator 21 is set to "1" at the time of A>B. It seems to show the Q output BLK2 of a flip-flop 22 in (c) with the continuing flip-flop 22, since this BLK1 is overdue by 1CLK. It seems that the Q outputs BLKHL2 and BLKLH2 of the flip-flops 23 and 24 which receive these [BLK1 and BLK2] are shown in (d) and (e), respectively. Here, a signal BLKHL2 shows the changing point from black to white, and BLKLH2 shows the changing point from white to black.
[0024] Next, the circuit shown in drawing 6 is explained. In drawing, the AND gate in which G20 receives the reversal signal of LEFT2 signal (refer to (d) of drawing 3) and BLK2 signal (refer to (c) of drawing 5), the AND gate in which G21 receives BLKHL2 signal (refer to (d) of drawing 5) and INHV3 signal (refer to (f) of drawing 3), and G22 are AND gates which receive INHV3 signal and BLKLH2 signal (refer to (e) of drawing 5).
[0025] The AND gate in which G23 receives the reversal signal of BLK2 signal and RIGT2 signal, and G24 are AND gates which receive the reversal signal of 1 scan-period signals FIND1 and FIND2. These 1 scan-period signals FIND1 and FIND2 are signals with which the phase shifted by one clock. The OR gate in which G25 receives the output and feedback signal of AND gates G20 and G21, and G26 are AND gates which undergo the output of FHV2 signal and OR gate G25. 25 is a d-type flip-flop from which the output of AND gate G26 is received in the D input, and it receives a clock in clocked into CLK. Q output of this flip-flop 25 was set to LMSK3, and this signal is contained in OR gate G25 as said feedback signal.
[0026] The AND gate in which G27 receives the reversal signal of the Q output LMSK3 of a flip-flop 25 and the output of AND gate G21, the OR gate in which G28 receives the output of AND gate G27 and the output of AND gate G20, and 26 are the flip-flops of D type with which the output of OR gate G28 is received in the D input, and they receive a clock in the clocked into CLK. Q output of this flip-flop 26 -- the 1st -- it is set to count (MSK1) latch signal M4HCE.
[0027] The OR gate in which G29 receives the output of AND gate G23 and the output of AND gate G22, and 27 are the flip-flops of D type with which the output of OR gate G29 is received in the D input, and they receive a clock in the clocked into CLK. Q output of this flip-flop 27 -- the 2nd -- it is set to count (MSK2) latch signal M4LCE. 28 is the flip-flop of D type with which the output of AND gate G24 is received in the D input, and it receives a clock in the clocked into CLK. Q output of this flip-flop 28 is made into a MSKCE signal (scan start signal).
[0028] In the counter output CNT2 of 13 bits, 29A is the flip-flop of D type which receives FIND6 signal in reset input R, and receives a clock for an M4HCE signal in clocked into CLK at enable input CE, and 29B is the flip-flop of D type which receives FIND6 signal in the reset input R, and receives a clock for an M4LCE signal in the clocked into CLK at enable input CE to the D input about the counter output CNT2 at the D input.
[0029] 29C is the flip-flop of D type which receives a MSKCE signal in the enable input CE, and receives a clock for Q output of flip-flop 29A in the D input at the clocked into CLK. 29D is the flip-flop of D type which receives a MSKCE signal in the enable input CE, and receives a clock for Q output of flip-flop 29B in the D input at clocked into CLK. And Q output of flip-flop 29C is [the 1st count signal (the 1st mask signal) MSK1 (13 bits) and Q output of flip-flop 29D] the 2nd count signal (the 2nd mask signal) MSK2 (13 bits). Thus, it will be as follows if actuation of the constituted circuit is explained referring to a timing diagram.
(1) When a manuscript is larger than assignment size, it is the case that a manuscript is larger than assignment size (the front end PLFT, the back end PRIGT), in this case. In this case, the mask signals

MSK1 and MSK2 which carry out the mask of the field outside a manuscript of 1 scan line were prescribed by the assignment sizes PLFT and PRIGT. Drawing 7 is a timing diagram which shows the actuation at this time. In drawing the maximum image effective width signal and (b) (a) A reference clock, BLK2 signal (refer to (c) of drawing 5) and (d) (c) BLKHL2 signal (refer to (d) of drawing 5), BLKLH2 signal (refer to (e) of drawing 5) and (f) (e) LEFT2 signal (refer to (d) of drawing 3), RIGT2 signal (refer to (e) of drawing 3) and (h) (g) INHV3 signal (refer to (f) of drawing 3), (i) is [an M4HCE signal (Q output of a flip-flop 26) and (k of LMSK3 signal (Q output of a flip-flop 25) and (j))] M4LCE signals (Q output of a flip-flop 27).

[0030] In this case, the picture signal PD 1 from a manuscript is outputted early. Therefore, BLK2 signal which shows that the manuscript was detected is set to "0" from early, as shown in (c). That is, BLK2 signal is "0" from left-hand side [signal / which was generated in the counter section 10 / LEFT2] in this case. The reversal signal goes into AND gate G20. And as shown in (f), in the standup of LEFT2 signal generated in the counter section 10, the output of AND gate G20 is set to "1", it is the standup of a clock and a flip-flop 26 latches "1" level. Consequently, signal M4HCE for latching the 1st count signal MSK1 starts to "1", as shown in (j). That is, signal M4HCE which latches MSK1 signal is generated from LEFT2. Since LEFT2 signal is generated from the set point PLFT which shows assignment size (refer to drawing 3), the front end section of an effective image field will be prescribed by PLFT.

[0031] Next, BLK2 signal is "0" from right-hand side [RIGT /2 / which was generated in the counter section 10] so that more clearly than (c) and (g). The reversal signal goes into AND gate G23. And as shown in (g), in the standup of RIGT2 signal generated in the counter section 10, the output of AND gate G23 is set to "1", it is the standup of a clock and a flip-flop 27 latches "1" level. Consequently, signal M4LCE for latching the 2nd count signal MSK2 starts to "1", as shown in (k). That is, signal M4LCE which latches MSK2 signal is generated from RIGT2. Since RIGT2 signal is generated from the set point PRIGT which shows assignment size (refer to drawing 3), the back end section of an effective image field will be prescribed by PRIGT.

[0032] The above mentioned M4HCE signal and the above mentioned M4LCE signal are contained in Flip-flops 29A and 29B as an enable signal, respectively. The counted value CNT2 of a counter 11 is latched to Flip-flops 29A and 29B in the standup of the clock CLK after the time of these enable signals becoming effective. The output of these flip-flops 29A and 29B is contained in D input of the latter flip-flops 29C and 29D. And from flip-flop 29C, MSK2 signal is outputted for MSK1 signal from flip-flop 29D. The T1 point counted value CNT2 of (j) turns into a value of MSK1, and the T2 point counted value CNT2 of (k) turns into a value of MSK2.

[0033] Here, the output CNT2 of a counter 11 is latched by said M4HCE signal and the M4LCE signal, and the 1st counted value MSK1 and the 2nd counted value MSK2 are held until the scan of the following scanning line is started by the signal MSKCE which shows the following scanning-line start point.

(2) When a manuscript is smaller than assignment size, it is the case that assignment size (the front end PLFT, the back end PRIGT) is larger than a manuscript, in this case. In this case, the mask signals MSK1 and MSK2 which carry out the mask of the field outside a manuscript of 1 scan line were prescribed by manuscript size. Drawing 8 is a timing diagram which shows the actuation at this time. The same thing as drawing 7 attaches and shows the same sign.

[0034] In this case, as shown in (c), early BLK2 signal which shows that the manuscript was detected is not detected, but since it is not a manuscript field at the beginning of a scan, BLK2 signal is still "1" which shows black. Therefore, in AND gate G20, the mask of the LEFT2 signal is carried out by BLK2 signal, and the output of AND gate G20 is "0." In this case, signal M4HCE for BLK2 signal to latch MSK1 signal which is Q output of a flip-flop 26 to the beginning on the point (point set to "1" as BLKHL2 shows (d)) on which it is set to "0", as shown in (c) is generated as shown in (j). Here, the point with which BLK2 signal is set to "0" to the beginning shows that the manuscript was detected.

[0035] Moreover, to the occurrence timing of RIGT2 shown in (g) generated in the counter section 10, as shown in (c), BLK2 signal is "1" which shows black, and the mask of the RIGT2 signal is carried out by BLK2 signal. In this case, it is generated as signal M4LCE for latching MSK2 signal which is Q

output of a flip-flop 27 on the point (point set to "1" as BLKLH2 shows (e)) on which BLK2 signal is finally set to "1" as shown in (c) shows (k). Here, the point with which BLK2 signal is finally set to "1" shows that manuscript termination was detected.

[0036] A these M4HCE signal and an M4LCE signal go into Flip-flops 29A and 29B, respectively, and are latched in the standup of CLK. And Q output of these flip-flops 29A and 29B starts D input of Flip-flops 29C and 29D, respectively. And it is latched by the flip-flop MSKCE signal, and is outputted as MSK1 and MSK2 signal from Q output of each flip-flop 29C and 29D. These [MSK1] and MSK2 signal are held until the scan of the following scanning line is started.

(3) BLK2 signal is fixed to "1" which always shows black when there is no manuscript 4 on the view scanning line, as it is shown in drawing 9 , when there is no manuscript on the view scanning line. Therefore, Q output M4HCE of flip-flops 26 and 27 and M4LCE are still "0" so that clearly from the circuit diagram of drawing 6 . Q output of Flip-flops 29A and 29B is still "0." MSK1 and MSK2 signal which is Q output of the flip-flops 29C and 29D latched in response to these Q output is still "0000H", respectively. Fig. 9

[0037] Drawing 10 is the circuit diagram showing the example of a detail configuration of the Rhine memory 30. As Rhine memory 30, FIFO (First In First Out) mold memory is usually used. However, it is also realizable using general SRAM (static RAM). In drawing, input image data is inputted into a data input terminal by 8 bits.

[0038] The maximum effective width signal FHV2 is inputted into each input terminal as light reset-signal *WRST and lead reset-signal *RRST (* shows negative logic), and write enable signal input terminal *WE and lead enable signal input terminal *RE are grounded, respectively. Therefore, it has come to be always able to perform writing and read-out. It reads with write-in clocked into WCLK, and Clock CLK is inputted into clock input-RC LK in common.

[0039] Thus, actuation of the constituted circuit is explained using the timing diagram of drawing 11 . For (a), in drawing 11 , CLK and (b) are [input image data DIN and (d of maximum effective width FHV2 signal and (c))] output image data DOUT(s). The input image data inputted as shown in (c) shows the case where the number of pixels per 1 scanning line is k+1 piece. A sequential shift is carried out in that interior with the clock CLK shown in (a), from that output terminal, it is delayed by one line and this input image data is outputted, as shown in (d).

[0040] Drawing 12 is the circuit diagram showing the example of a detail configuration of the processing-field outside section 40. In drawing, the 1st comparator with which 41 receives the output CNT2 of 13 bits of the counter section 10 in the A input, and receives MSK1 signal in the B input, and 42 are the 2nd comparator with which the output CNT2 of 13 bits of the counter section 10 is received in the A input, and they receive MSK2 signal in the B input. These comparators 41 and 42 output a pulse at the time of A=B.

[0041] 43 is a set-reset flip-flop with which the output of the 1st comparator 41 is received in set input S, and it receives the output of the 2nd comparator 42 in reset input R. Q output of this flip-flop 43 becomes the mask signal MSK which carries out the mask of the outside of the field of a manuscript image. G30 is an AND gate which inputs a mask signal MSK into the input of one of these in common, and receives the image data (8 bits) from the Rhine memory 30 in the input of another side. The number of these AND gates G30 is eight corresponding to the number of bits of data. And the output from these AND gates G30 serves as output image data to which the mask of the outside of a field was carried out. Thus, it will be as follows if it explains referring to the timing diagram which shows actuation of the constituted circuit to drawing 13 .

[0042] In drawing 13 , (a) shows a mask signal MSK and (b) shows output image data DOUT, respectively. The set-reset flip-flop 43 is set by the output (MSK1 signal) of the 1st comparator 41, it is reset by the output (MSK2 signal) of the 2nd comparator 42, and the Q output MSK serves as a pulse of width of face as shown in (a). The width of face w of this pulse serves as the range of actual image data. Then, if the mask of the image data which enters from the Rhine memory with this mask signal and which was in one line is carried out, except a manuscript field, it will become data "00H" and will be transposed to white. A manuscript field is outputted as it is.

[0043] Thus, since fields other than a manuscript field are transposed to white according to this invention, as shown in (a) of drawing 18 , even if the metaphor manuscript 4 is placed aslant, it is not outputted black. Moreover, in the case of the fold part of a book, since the reflective signal is very small, the same actuation as the field outside a manuscript is performed. Therefore, a mask signal MSK is always "0" and all fields are replaced white.
[0044] In addition, there is a part called the spatial filter for processing edge enhancement, smoothing, etc. as the usual image-processing section. It seems that for example, the circuit of a spatial filter part is shown in drawing 14 when the matrix filter of 3x3 is used. Here, 50 is 51 and the spatial filter of 3x3 and 52 are FIFO memories. Input image data is contained in the spatial filter 50 as it is, the input image data which delayed this input image data of only one line by FIFO memory 51 is contained in the spatial filter 50, and the input image data which delayed further the output of one line of this FIFO memory 51 by FIFO memory 52 is contained in the spatial filter 50. Thus, three image data will go into a spatial filter 50, and matrix processing is performed.
[0045] Here, you may use also [FIFO memory / 51 / which is shown in drawing 14] as Rhine memory 30 used by this invention. Since processing image data is delayed for the processing time in a spatial filter 50 at this time, the processing-field outside section 40 shown in drawing 12 also needs to perform delay corresponding to it.
[0046]
[Effect of the Invention] As mentioned above, as explained to the detail, while making a PURISU can unnecessary according to this invention, it can do, although an effective image processing system is offered also to the fold of a slanting manuscript or a book, and practical effectiveness is large.

[Translation done.]

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the principle block diagram of this invention.
[Drawing 2] It is the circuit diagram showing the example of a detail configuration of the counter section.
[Drawing 3] It is the timing diagram which shows actuation of the counter section.
[Drawing 4] It is the circuit diagram showing a part of example of a detail configuration of an effective image field detecting element.
[Drawing 5] It is the timing diagram which shows actuation of the circuit shown in drawing 4 .
[Drawing 6] It is the circuit diagram showing the remaining examples of a detail configuration of an effective image field detecting element.
[Drawing 7] It is the timing diagram which shows actuation of the circuit shown in drawing 6 .
[Drawing 8] It is the timing diagram which shows actuation of the circuit shown in drawing 6 .
[Drawing 9] It is an explanatory view in case there is no manuscript on the view scanning line.
[Drawing 10] It is the circuit diagram showing the example of a detail configuration of the Rhine memory.
[Drawing 11] It is the timing diagram which shows actuation of the Rhine memory.
[Drawing 12] It is the circuit diagram showing the example of a detail configuration of the processing-field outside section.
[Drawing 13] It is the timing diagram which shows actuation of the processing-field outside section.
[Drawing 14] It is the block diagram showing the example of a configuration of the image-processing section.
[Drawing 15] It is the conceptual diagram of equipment conventionally.
[Drawing 16] They are other configuration conceptual diagrams of equipment conventionally.
[Drawing 17] It is drawing showing the example of a manuscript reading image.
[Drawing 18] It is the explanatory view of the trouble of equipment conventionally.
[Description of Notations]
10 Counter Section
20 Effective Image Field Detecting Element
30 Rhine Memory
40 Processing-Field Outside Section

[Translation done.]

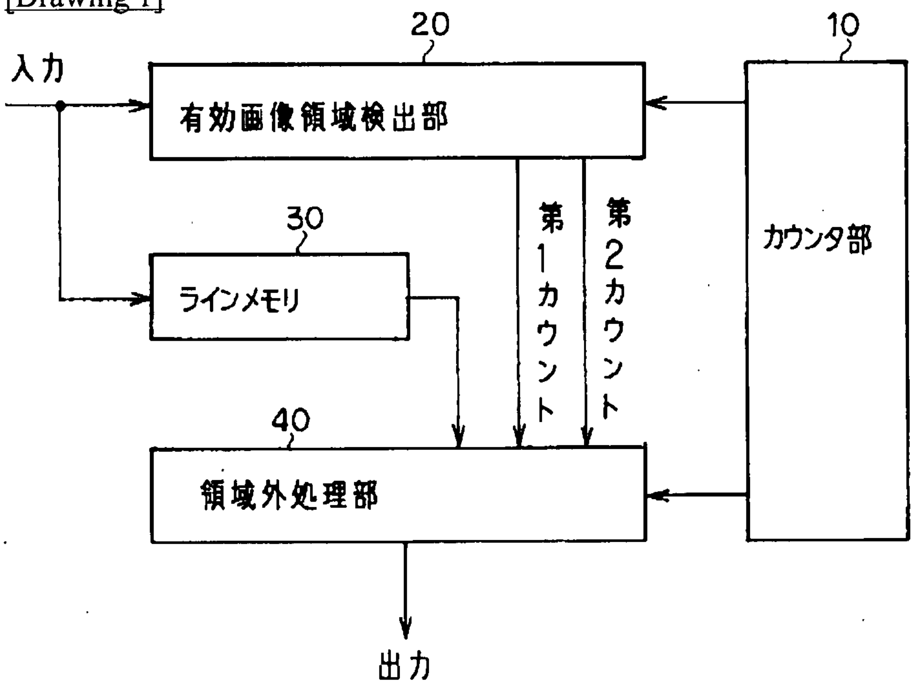
* NOTICES *

JPO and INPIT are not responsible for any damages caused by the use of this translation.

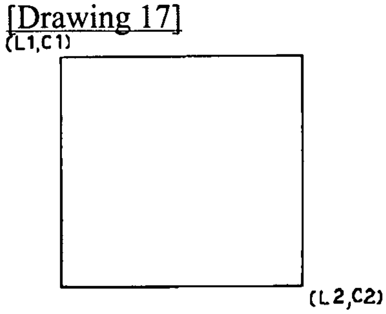
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

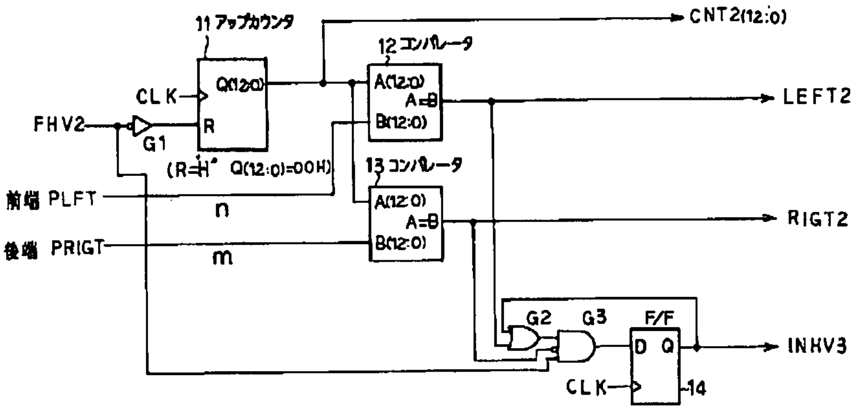
[Drawing 1]



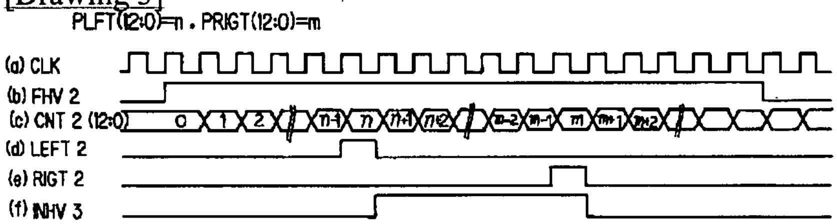
[Drawing 17]



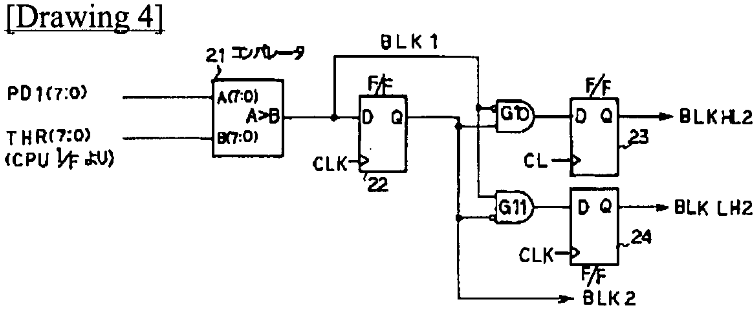
[Drawing 2]



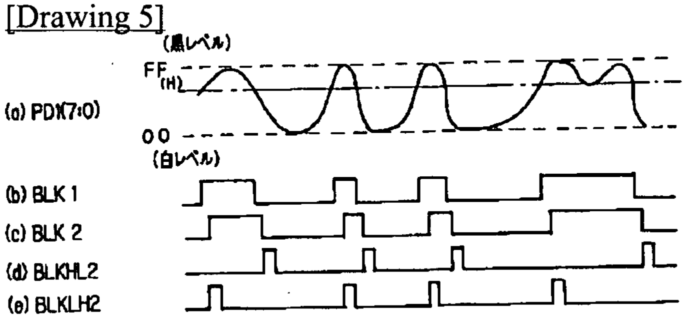
[Drawing 3]



[Drawing 4]



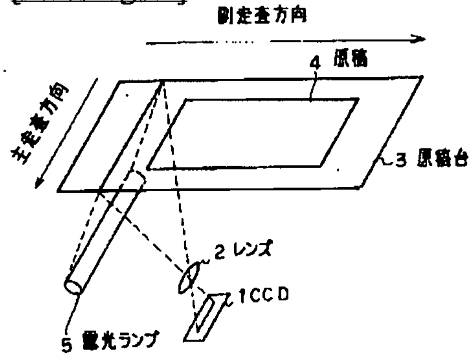
[Drawing 5]



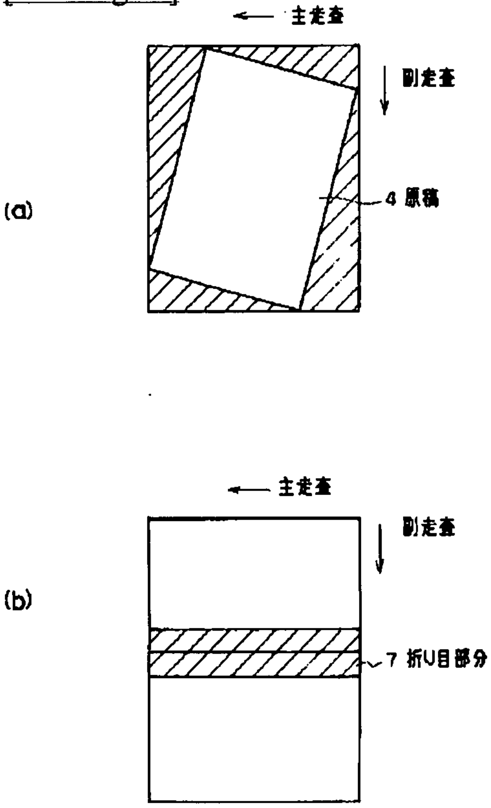
blk to wht

wht to blk

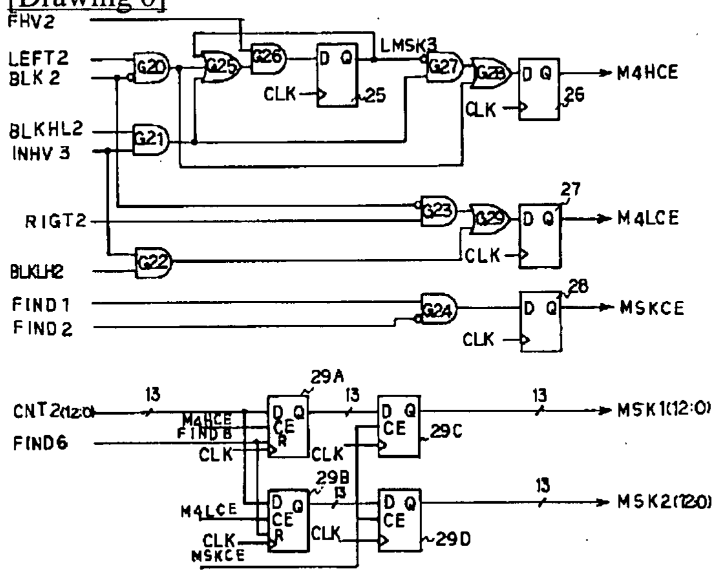
[Drawing 15]



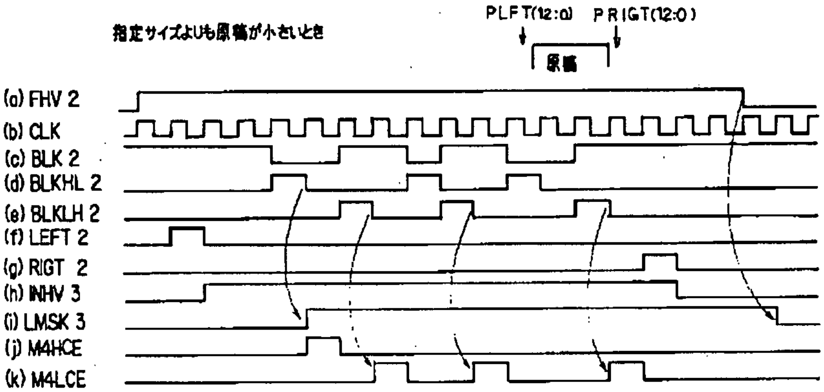
[Drawing 18]



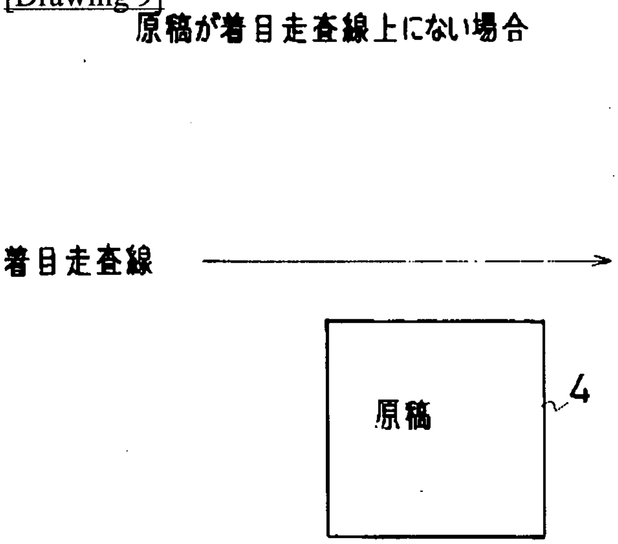
[Drawing 6]



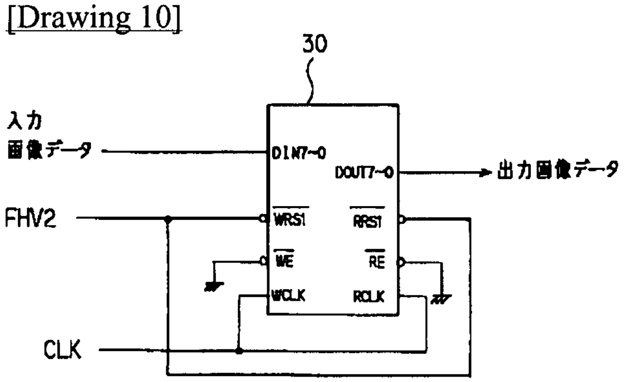
[Drawing 8]



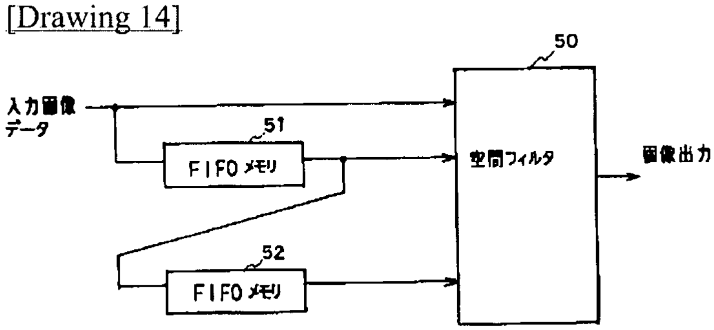
[Drawing 9]



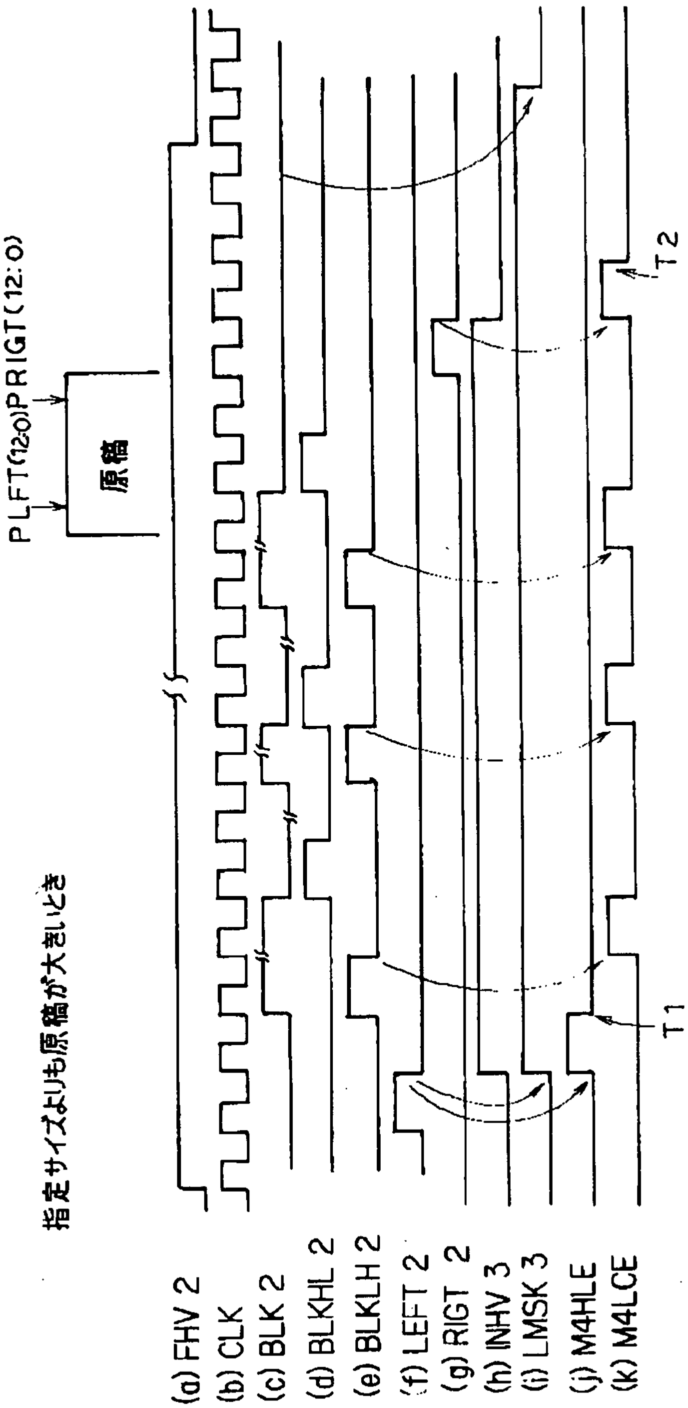
[Drawing 10]



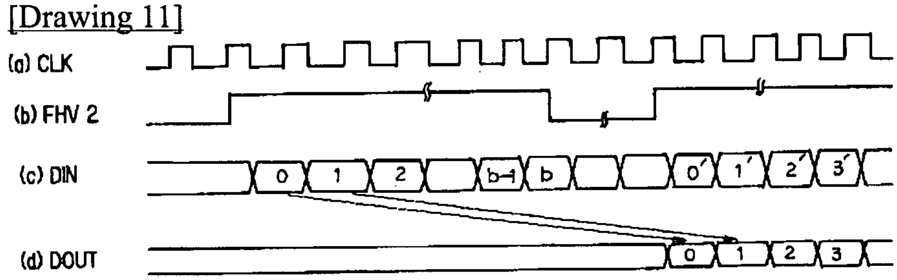
[Drawing 14]



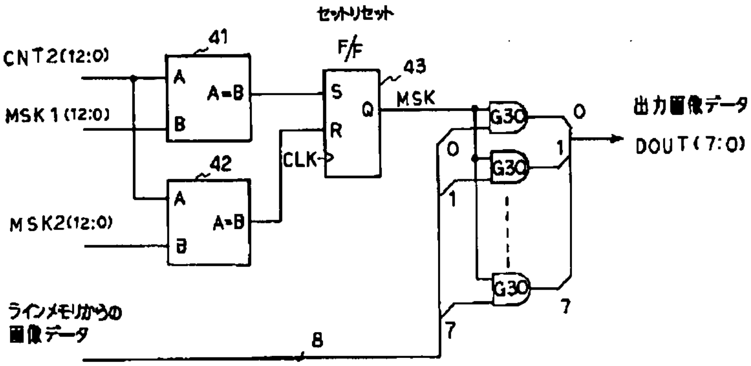
[Drawing 7]



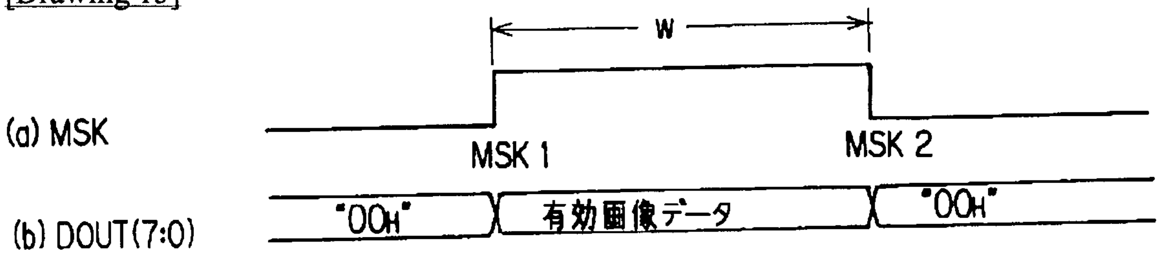
[Drawing 11]



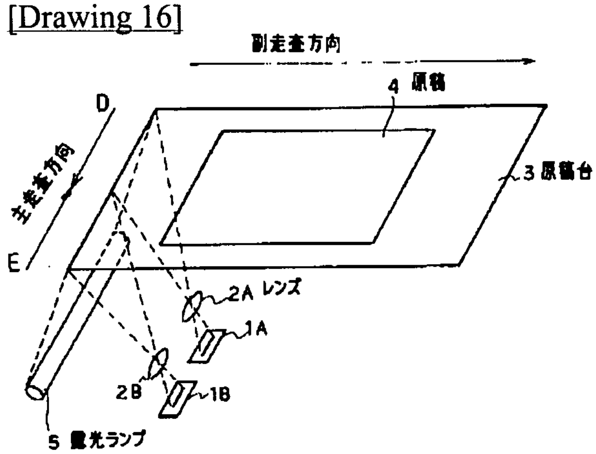
[Drawing 12]



[Drawing 13]



[Drawing 16]



[Translation done.]